

## REVIEW.

ART. XIV.—*Trial of John Hendrickson, Jr., for the Murder of his Wife by Poisoning, at Bethlehem, Albany County, N. Y., March 6, 1853.* Reported by Messrs. BARNES & HEVENOR. Albany, 1853. 8vo. pp. 176.

THIS report contains the history of one of the most interesting and important trials in the records of medical jurisprudence in our country. It is the first, and we believe the only instance in which the question of poisoning by *aconite* has been brought before our courts of law; and the facts elicited on the trial, though of a negative rather than a positive kind, are of great importance in legal medicine, and deserving of permanent record.

The present report has been published under the sanction of the counsel who were engaged both in the prosecution and defence of the deceased, and may therefore be regarded as a correct and authentic document. It contains, in addition to the testimony elicited upon the trial, the arguments of the counsel, the charge of the judge to the jury, and the sentence of the court, after the verdict of guilty was rendered by the jury.

A brief history of the case will be necessary in order to appreciate the nature of the testimony, on which we design to make a few comments.

The accused, John Hendrickson, Jr., a young man twenty years of age, born of respectable parents, married, at the age of eighteen, Maria Van Dusen, a young lady of seventeen, also of highly respectable connections, well educated, amiable, and intelligent. There is no evidence that they lived together unhappily; and although the District Attorney, in his opening speech, spoke of the prisoner having communicated syphilis to his wife, there is no satisfactory proof that such had been the case; but, on the contrary, it is quite evident that she had laboured under a severe form of leucorrhœa. On the night of the 7th of March, 1853, after attending church in the evening, she retired to bed with her husband at her father-in-law's, between ten and eleven o'clock, complaining of a severe pain in her head, hips, and loins, and at two o'clock was found dead by her husband, "occupying nearly the centre of the bed, lying at full length on her back, with her hands either crossed, or lying down by her side, the bedclothes covering her person." A coroner's inquest was held the same evening, and a *post-mortem* examination ordered, which was made thirty-six hours after death by Dr. J. Swinburne, Dr. Ingraham, and the coroner, Mr. Smith, being present. Four days after, the body was disinterred, and further *post-mortem* dissection made, the first, for some reason not specified, having been incomplete. The principal appearances noticed are the following: Great pallor of the surface; calm expression, and no distortion of features; sugillation on the posterior parts of the body; great rigidity and *elasticity* of the muscles; lungs and heart healthy; heart empty of blood, except a small clot in the right auricle; the vena cava partly full of dark fluid blood; stomach and small intestines empty; liver healthy; gall-bladder half full of bile; mucous coat of stomach very red, lined with a thick reddish mucus, corrugated, the stomach itself contracted to two inches in diameter, and its coats hypertrophied; the mucous

coat of duodenum also corrugated, and more congested than that of the stomach; uterus enlarged to twice its natural size, hardened, and its cervix slightly ulcerated, with adhesions to the rectum and small intestines; ovaries considerably enlarged; spleen and pancreas healthy; urinary bladder contracted; brain healthy, no congestion; tongue white, and a little swollen; a small ecchymosed mark on inside of lower lip, showing a cut about a quarter of an inch in length (throat, œsophagus, spinal cord, and lower portion of intestinal canal not examined). At the next examination, five days after, the kidneys were found healthy, feces in the cæcum;—portions of lung, liver, and pancreas, with four ounces of blood from cavity of chest, were removed, placed in jars, and carefully covered.

To the question, on the subsequent trial, "What was the cause of death?" Dr. S. replied:—

"Acrid poison. I base it on this: I find entire emptiness of the stomach and small intestines, so far as fecal matter is concerned; also contraction and corrugation of the same to a great extent. I find in place of that a reddish *viscid* mucus adhering to the coat of the stomach and intestines: the emptied condition of the gall-bladder; the appearance of the tongue. *I inferred from these that vomiting had taken place*, and that, too, induced by some acrid matter, which would not only expel the contents of the stomach, but of the small intestines, the presence of which acrid matter would induce the vomiting."

To the question, "What would induce your belief that she vomited?" the witness replied:—

"I believe the act of vomiting is accompanied by more or less contraction of the stomach; where that act is induced by the presence of acrid matter, *the contraction will be proportional to the material used, be it more or less irritating.*" "The corrugation would be owing, in part, to the contraction of the muscles, and part to the irritating matter applied to the mucous surface." "The rigidity of the body presented the appearance of a person destroyed by anything *which would produce a sudden spasm or contraction of the muscles.* The appearance of the stomach and intestines proved to me *conclusively* that she had vomited, and, to such a degree as could not be produced by ordinary causes; and I think the effort at vomiting continued until exhaustion took place. My reasons are these: *the blood, in the first place, was thrown from the centre to the surface; also, the extreme pallor of the countenance, which always attends exhaustion from vomiting.*"

To the question, "Will you state, in your judgment, from what poison she came to her death?" Dr. Swinburne replied:—

"*I suppose the deceased died from aconite, from the fact of the appearance on the post-mortem examination being so identical with those of the dogs and cats,*" (experimented on by Dr. Salisbury with tincture of aconite.)

The counsel then asked: "What is the strength of your opinion, that she died of poison?" Dr. S. replied:—

"*I have no doubt of it; I have no doubt that she vomited; one of my reasons for thinking she died of poison, was her having vomited, and also the absence of congestion. Had Mrs. H. died of natural causes, more or less natural contents would have been found in the small intestines, and they would have presented a healthy appearance, relaxed instead of contracted; also, the circulating system would have presented a different appearance. In all forms of death by asphyxia, syncope, apoplexy, epilepsy, and all the other forms of convulsive diseases, you have fulness or engorgement of the heart and all the important viscera.*" Again: "From my reading, knowledge, and experience, I am prepared to express an opinion as to what caused the morbid condition of the stomach and bowels—*it was aconite, or the principle of aconite.* Had the poisonous matter passed off with any of the fecal matter, I think the *rectum* would have pre-

sented the same appearance as the intestines, only in a less degree; can assign no possible way, except by vomiting, how the fecal matter could have been removed."

"What external appearances would you look for, where death has been caused by aconite in three or four hours?"

"Should expect to find rigidity of all the voluntary muscles; also, extreme pallor from vomiting."

The testimony of Drs. Ingraham and Coroner Smith, though lacking the positiveness of that of Dr. S., just given, is of similar tenor, so far as regards the *post-mortem* appearances. Both express the opinion that death was caused "by some acrid substance introduced into the stomach." Both also were willing to swear, from the appearance of the stomach, that severe vomiting had taken place previous to death. Dr. Smith, however, was inclined to think that death was occasioned by the influence of some poison on the nervous system.

We hardly dare trust ourselves to comment on the above testimony as it deserves; for, if there is any principle established in legal medicine—one in which all pathologists agree—it is, that no positive proof of poisoning can be derived from the *post-mortem* appearances, either in the internal or external parts of the body.

"Any evidence," says Taylor, "derivable from the appearances in the body of a person poisoned, will be imperfect unless we are able to distinguish them from those analogous changes, often met with as the results of ordinary disease. These are confined to the mucous membrane of the stomach and bowels. They are redness, ulceration, softening, and perforation; all of these conditions may depend upon disease, as well as upon the action of irritant poisons."<sup>1</sup>

So also Guy: "The symptoms and *post-mortem* appearances produced by poisons are not peculiar to them, but may be produced by natural causes, and form a part of common diseases."<sup>2</sup>

And yet Dr. S., on his cross-examination, states that "he never read in any work on medical jurisprudence that a physician should not give an opinion of the death of a person from poison from the mere appearances on *post-mortem* examinations;" and thought that "a prudent person would express such opinion; and that a person could give evidence of death by *aconite* merely from the inspection of the person after death!"—also, that "inflammation never takes place except from the presence of some irritant!"

With regard to the degree of "congestion" of the mucous membrane of the stomach, &c., the sum of the medical testimony is as follows: Dr. Smith remarks, that he "did not examine the bowels or duodenum particularly, only they appeared smaller than usual." Dr. Ingraham speaks of a "red-den appearance of the folds of the stomach." If the redness of the mucous surface had presented anything very remarkable, it would probably have been brought out more prominently. Dr. Swinburne's testimony is, that "the vessels were so filled that the mucous surface looked very red, and the mucous coat was lined with a thick reddish mucus." Dr. S. regards the redness as simply "congestion, and not inflammation." There were about two ounces of reddish mucus in the stomach, which was hypertrophied, but its villous coat less congested than that of the duodenum; paler, but more corrugated than the latter. The duodenum was empty, and smaller than natural. The remainder of the intestinal canal was not examined till four days afterwards, when the body was exhumed.

<sup>1</sup> Taylor on Poisons, Am. ed. p. 100.

<sup>2</sup> Med. Jur., Am. ed. p. 544.

Admitting, then, that there was an unusual degree of redness or congestion of the mucous membrane of the stomach, it is now well established that it is not uncommon to find such appearances, not dependent on the action of poison or any assignable cause. Dr. Taylor, in his work on Poisons (p. 101, Am. ed.), remarks that—

“A person may die without suffering from any symptoms of disordered stomach; but on an inspection of the body, a general redness of the mucous membrane of this organ will be found, not distinguishable from the redness which is so commonly seen in arsenical poisoning. Several cases of this kind have occurred at Guy’s Hospital; and drawings have been made of the appearance of the stomach, and are now preserved in the museum collection. A record has been kept of four of these; and it is remarkable that, although in not one of them, before death, were any symptoms observed indicative of irritation or disease of the stomach, yet in all, the stomach was found more or less reddened, and in two exclusively so. Such cases are only likely to lead into error those who trust to this *post-mortem* appearance alone as evidence of poisoning; but no medical jurist, aware of his duty, could ever be so misled.”

He then gives a case of a young woman far advanced in pregnancy, who died suddenly in a fit of syncope, and where, after death, “the mucous membrane of the stomach was reddened, and thrown into rugæ.” There is also an interesting case recorded in the *Annals of Hygiene*, 1835, vol. i. p. 227, where it is probable that this pseudo-morbid appearance of the mucous membrane was mistaken for the effects of irritant poison. Dr. Yellowly has also shown very clearly that the mucous membrane of the stomach often presents a high degree of vascularity and redness in cases of sudden death (*Med.-Chir. Trans.* 1835). He met with this appearance, as we have also in the stomachs of executed criminals, &c., and after presenting a great array of facts, adduces from them the following conclusions: 1. That vascular fulness of the lining membrane of the stomach, whether florid or dark-coloured, is not a special mark of disease, because it is not inconsistent with a previous state of perfect health. 2. That those pathologists were deceived, who supposed, from the existence of this redness in the stomach, that gastritis sometimes existed without symptoms. 3. That erroneous conclusions as to the cause of death are frequently owing to the same mistaken observations, the effects of putrefaction and spontaneous changes induced by the loss of vitality, being sometimes attributed to the action of poisons. 4. That the vascularity in question is entirely venous, the florid state of the vessels arising from the arterial character of the blood remaining in the veins for some time after its transmission from the arterial capillaries at the close of life; the appearance is, however, sometimes due to transudation only. 5. That the fact of inflammation having existed previously to death, cannot be inferred merely from the aspect of vessels in a dead part; there must at least have been symptoms during life. These positions are now also maintained by Andral and the best French pathologists, as well as those of Germany and this country; so that redness of the mucous membrane of the stomach and intestinal canal can no longer be regarded as proving the past existence of inflammation, unless there have been symptoms during life, or other marked effects of the inflammatory process in the alimentary canal, or the discovery of the poison itself. We may also, in this connection, refer to the cases recorded by the late Prof. W. E. Horner, in the first volume of this Journal, for evidence of the same fact. Prof. Horner was one of the first to prove that there may be great congestion of the mucous membrane of the stomach, abundant mucus, and great corrugation and contraction, without previous inflammation, and where death has resulted from other diseases. In one case, where death was sudden, and no

suspicious of poisoning, he found the gastric coats thick and dense, the mucous coat thrown into numerous folds, or well-marked, elevated rugæ, and almost universally of a deep arterial red. The red corpuscles were extravasated in numerous spots and blotches. Dr. Beck also remarks:—

“MM. Nigot and Trousseau, and M. Billard, have pursued the investigation of this subject to a great extent. The former have proved by experiment, that various kinds of pseudo-morbid redness may be formed, which cannot be distinguished from the parallel varieties caused by inflammation; that these appearances are produced after death, and not until three, five, or eight hours after it; that they are to be found in the most depending parts of the stomach, and turns of the intestines; and that, after they have been formed, they may be made to shift their place, and appear where the membrane was previously healthy, by simply altering the position of the gut.”<sup>1</sup>

It is very evident then that redness, quite equal in degree to that observed in the case of Mrs. Hendrickson, is no uncommon appearance in *post-mortem* examinations, and the redness would seem to be intense in proportion as the death has been sudden and the circulation active. The redness in the present instance was no greater than is usually met with in cases where death is as sudden. The “reddish mucus” in the stomach may, perhaps, be satisfactorily accounted for from the presence of the colouring matter of tomatoes, which the deceased ate freely shortly before her death. The microscope might have settled this question definitely.

The other phenomena mentioned, on which considerable stress appears to have been laid, viz: pallor of the surface, and rigidity, and elasticity of the muscles, &c., are even less significant or characteristic of poisoning than the slight congestion already noticed. Neither can be considered as indicative of modes of death; their absence, indeed, might be worthy of note in a suspected case, but not their presence. In all cases of death from irritant poisons, especially the narcotico-irritants, which we have had an opportunity of observing, there have been crimson or livid-coloured patches on various parts of the body, and considerable tympanitis, though we cannot affirm that these phenomena are invariably present in such cases. There has also been considerable bloody, frothy mucus in the mouth, fauces, and œsophagus, especially when vomiting has been severe. No such phenomena were noticed in the present instance; only we are told that the tongue was “swollen, and very white,” an appearance not particularly indicative of gastric irritation. It is also worthy of note, that the “pallor” is attributed to the “blood having been thrown from the centre to the circumference, by vomiting,” which we should suppose would have the opposite effect.

“The rigidity of the body,” says Dr. S., “presented the appearance of a person destroyed by anything which would produce a sudden spasm or contraction of the muscles.”

Here it is assumed that the deceased died from spasm, and that the spasmodic state of the muscles continued after vitality was extinguished (thirty-six hours after death). No allusion is made to the *rigor mortis*, as a common cadaveric phenomenon; but it is claimed throughout the direct testimony, that the stiffness of the body was owing to some poison which had caused severe spasm; and because the witness had noticed the same rigidity in dogs, destroyed by aconite, he does not hesitate to express the opinion that the deceased came to her death from the same poison. Now, cadaveric rigidity takes place in all classes of animals alike; coming on as soon as muscular irritability ceases, confined to the muscular system in many cases, giving extreme rigidity to the

<sup>1</sup> Med. Jur. vol. ii. p. 310.

body, its degree and duration, *cæteris paribus*, being directly as the muscular development; continuing longer the later it occurs, and *vice versâ*; influenced greatly by the nature of the disease, or the cause of death; appearing more speedily, and lasting a much shorter time, when death has occurred from some chronic wasting disease, as phthisis, fever, scurvy, &c., coming on slowly and being strongly developed, and lasting often for several days, when the death has been occasioned by acute inflammation of the stomach, or by irritant poisons. We have known cadaveric rigidity continue four or five days after death from cholera. Any one conversant with these facts, would hardly dare derive any positive conclusion as to the cause of death from the presence of muscular rigidity. We dismiss it, therefore, with the "pallor" and "congestion," as wholly insufficient to justify the conclusions deduced from it.

Considerable stress is also laid by the witnesses, on the "corrugation and contraction of the stomach;" but these are so often met with in death from natural causes, that no significance can be properly attached to them. Prof. Horner has shown that *rugæ* of the stomach are quite common in *post-mortem* examinations, and that they appear in cases where no stimulants or irritants have been applied, and in stomachs perfectly healthy, and that they are more frequently met with in cases of sudden death; and yet it is assumed, in the case of Mrs. H., that these *rugæ* were owing to the *astringent* properties of aconite, which has heretofore been regarded as a *paralyzant*, and not a stimulant.

We do not hesitate to say that aconite has no power to "shrivel vegetable membranes," as claimed upon the trial; though it will destroy vegetable life; the subsequent "shrivelling" is doubtless the result of the evaporation of water, or drying.

The diminished caliber of the stomach and intestinal canal, was in all probability the result of sudden death, leaving the organic contractility of the muscular fibre unimpaired.

Extensive experiments have been made with aconite upon the lower animals; but corrugation of the stomach has never been claimed as one of its *specific* effects. It was never observed by Orfila, or by Fleming. The presence of two ounces of viscid mucus in the stomach, is regarded by Dr. F. as positive proof that an irritant had been swallowed, and yet Dr. Horner gives cases (*loc. cit.*) where the same amount of similar mucus was found in healthy stomachs. It is not unusual to meet with considerable quantities of mucus in the stomach, after death from various diseases; nor was its colour by any means remarkable under the circumstances; and yet the witness states that he "had never seen viscid mucus in a stomach after death from natural causes," nor "clinging to the coat of the stomach." The deceased had eaten little or nothing during the day preceding her death (Dr. S. says ten or eleven hours), and speaks of the empty condition of the stomach and small intestines as a remarkable circumstance, and one which proved conclusively that severe vomiting had occurred previous to death. "I believe," says he, "that all the contents of the stomach and small intestines could be thrown up, and not a particle or trace be discovered in any part;" "the quantity in a healthy person would be from a pint to two quarts;" and "this might be thrown up in an hour." To another question he replied: "A healthy stomach might expel its contents in about three or four hours;" and "considerable portions of the fecal matter would remain in the small intestines twenty-four hours."

Criticism on such statements is a work of supererogation; according to Beaumont, the *longest* time required for digesting any substance, in the stomach of St. Martin, was five and a half hours, the average less than three. Food does

not long remain in the duodenum, and the *jejunum* is so called, because it is generally empty. It would have been strange, indeed, and contrary to the usual course of things, if anything had been found in the stomach and small intestines. Had the deceased eaten supper at six o'clock (and there is no evidence that she ate any dinner or supper, but very satisfactory proof that she did not, to any amount), it would not have been strange, death occurring eight hours after, to find the stomach and small intestines empty.

It was proved by at least two witnesses, that there were no evidences of vomiting in the room where the deceased slept, when found dead, there being but one vessel in the chamber, and that half filled with urine alone. There were also several persons sleeping in the house; but no one heard any noise from vomiting, or any other cause. The inference, then, that the empty state of the stomach, &c. (two ounces of mucus excepted), indicates previous vomiting, is just as unfounded and unsustained by facts as the former. Dr. Salisbury testifies that

"The *stomach* was much contracted, and drawn into folds and ridges; not more than half as large as the stomach in its natural state; much congested; the mucous coat covered with a whitish substance resembling viscid mucus, and this was covered with the blood." "The *duodenum* was contracted longitudinally and transversely, highly congested, the inner coat covered with viscid mucus, mixed with a slight quantity of a whitish matter, resembling chyme, and this was mingled with blood." "The *jejunum* was in a high state of congestion, contracted, its mucous coat covered with mucus, and a whitish substance resembling chyle, tinged with blood, the contraction less than in the duodenum."

The appearance of the *ilium*, Dr. S. states, was similar to that of the other small intestines, while the *cæcum*, colon, and rectum, were half filled with fecal matters, those in the rectum being "dry and hard." Dr. S. inferred that there was a "*tendency to purging*, because the fecal matter in the *cæcum* was thin and watery;" also, that vomiting had occurred from "the contracted condition of the stomach, its emptiness; the emptiness of the small intestines, and the high state of congestion and effusion of blood in these organs." "Had Mrs. S. taken her usual meals on *Saturday*," says Dr. S. (death occurred between one and two o'clock on Monday morning), "I should have expected to have found food in the small intestines."

Comment on this evidence is altogether unnecessary. Why the mucus in the *ilium* should be more deeply tinged with blood than that of the stomach, we are not informed. No one, on reading the evidence, can doubt that the stomach and small intestines were empty in obedience to the laws of their economy; the natural result of the performance of their healthy functions.

The gall-bladder was half full of bile, which, as we believe, is entirely inconsistent with the idea that severe vomiting had occurred. Dr. Swinburne says: "The gall-bladder does not become necessarily empty by vomiting; it has no peristaltic action."

Such violent vomiting, however, as is claimed to have occurred in this case, must, by compression, have forced all the bile from its cyst.

In short, the *post-mortem* appearances do not justify the inference that Mrs. Hendrickson vomited during the last hours of her life. This belief has been expressed by all the physicians, whose opinions have been sought for, including Prof. A. Clarke, of New York, A. March, P. Van Olinda, M. F. Cogswell, T. Hun, J. H. Armsby, J. P. Boyd, B. P. Staats, and T. R. Beck, of Albany. The New York Pathological Society, by a unanimous vote,

"*Resolved*—That the statements made by Dr. Swinburne, as printed in the *Report of the Trial of Hendrickson*, by Barnes and Havenor, Albany, 1853, con-

cerning the *post-mortem* appearances, as described by him in the case of Mrs. Hendrickson, in no wise justifies the opinion that death was produced by vomiting, or was caused by the administration of aconite; such appearances, especially those relating to the condition of the stomach, being often found in *post-mortem* examinations where no vomiting had occurred, and where no aconite had been taken before death.

"*Resolved*—That the *post-mortem* examination, as detailed by Dr. Swinburne, is faulty, wanting in detail as regards the condition of several important organs, and omitting to examine altogether the trachea and larynx, affections of which are known to produce sudden death."

The spinal cord was only examined down to the second cervical vertebra, and it is well known that death sometimes suddenly occurs from the rupture of a bloodvessel within the spinal canal.

In this connection, it will be appropriate to consider briefly the properties of aconite. Belonging to the natural family *Ranunculaceæ*, the *Aconitum Napellus* has generally been supposed to participate in the acrid properties of that class of plants, and hence it has been usually described as an *acrid narcotic*. It is now, however, well ascertained, that the aconite has very feeble, if any, acrid properties, the effects, such as nausea, and vomiting, &c., commonly produced by it, being occasioned by its violent action on the nervous system. Christison says its *acrid* powers are "doubtful or feeble." Pereira and Fleming do not admit that it possesses any. Taylor and Thomson also coincide in this opinion. Its peculiar effect upon the organs of taste, such as tingling, numbness, sense of heat, &c., Dr. Fleming shows to be a property belonging to its narcotic or sedative principle, and the measure of its activity as a poison. The aconite is not a stimulant, but a pure *paralyrant*.<sup>1</sup>

The importance of a correct knowledge of the properties of plants, is well illustrated in the case of Mrs. Hendrickson. Had it not accidentally come to light that some druggist at Albany had sold an ounce of *tincture of aconite*, to some unknown person previous to the death of Mrs. H., and had it not been erroneously assumed that aconite was a powerful *acrid*, no one would have ever suspected it to have been the cause of death, nor would any such interpretation have been given to the *post-mortem* appearances.

It is claimed in the present case, that nearly or quite an ounce of the saturated tincture of aconite (of which ten drops have proved fatal), was administered to Mrs. H., in consequence of which she vomited an hour or more incessantly, and then died from exhaustion, with composed and placid features, &c., with the *post-mortem* appearances already noticed.

The experiments of Dr. Fleming upon the lower animals with aconite, prove conclusively that neither the plant, nor any of its preparations, produces vas-

<sup>1</sup> MM. Geiger and Hesser, two distinguished French chemists, have investigated the properties of aconite with much success. They speak of it as follows: "Cette substance alcaline, ne cristallise pas; elle est inodore; elle a une saveur amère sans âcreté; elle n'est pas volatile; peu soluble dans l'eau très soluble dans l'éther et surtout dans l'alcool," &c. (*Traité Thérap. &c.*, par A. Trousseau and H. Pidoux, tom. ii. p. 118.)

MM. Merat and De Lens, in their *Dictionnaire Universel de Matière Médicale*, vol. i. p. 58, have described the properties of aconite very accurately, and in few words as follows: "Pris à la dose d'une drachme ou deux il [the root], produit un véritable empoisonnement. D'abord les sujets éprouvent une ardeur brûlante, une soif ardente, des vertiges se déclarent; de la cardialgie, des vomissements ont lieu, ainsi que des coliques atroces, avec déjections alvines; de la somnolence le manifeste, accompagnée des convulsions et d'une agitation extraordinaire; des sueurs froides et la mort viennent terminer cette scène de douleur au bout de deux à trois heures."

Sir B. Brodie as well as M. Orfila made many experiments with aconite on animals, and the latter describes the stomach and intestines as *free from inflammation*.—*Med. Leg.* ii. p. 54.



cularity in any membrane to which it is applied, even the lips and tongue when burning and tingling from its topical action; that this is purely a nervous phenomenon, and that inflammatory redness of the alimentary canal is never observed in animals poisoned by it.<sup>a</sup> The prominent symptoms, according to this careful observer, are weakness and staggering, gradually increasing paralysis of the voluntary muscles, slowly increasing insensibility of the surface, more or less blindness, great languor of the pulse, and convulsive twitches before death, with great contraction of the pupil and impairment of the muscular irritability, and, of course, loss of muscular power. When it proves fatal to the human subject, it generally does so by inducing extreme depression of the circulation, or paralyzing the muscles of respiration. Dr. Fleming states "that it may also kill, by an overwhelming depression of the nervous system, proving fatal in a few seconds, without arresting the action of the heart; and secondly by asphyxia, or arrest of respiration, the result of paralysis, gradually pervading the whole muscular system, respiratory as well as voluntary. Such are the results when very large doses are taken." The least variable symptoms in the human subject are, first, numbness, burning and tingling in the mouth, throat, and stomach; then sickness, vomiting, and pain in the epigastrium; next, general numbness, prickling and impaired sensibility of the skin, impaired or annihilated vision, deafness and vertigo; also frothing at the mouth, constriction at the throat, false sensations of weights or enlargements in various parts of the body; great muscular feebleness and tremor, loss of voice, and laborious breathing; distressing sense of sinking and impending death; a small, feeble, irregular, gradually vanishing pulse; cold clammy sweat, and pale, bloodless features, together with perfect possession of the mental faculties, and the tendency to stupor or drowsiness. Finally, sudden death at last, as from hemorrhage, and generally in a period varying from an hour and a half to eight hours. In a case observed by Fleming, where the *tincture of the root* had been taken, the symptoms began in a few minutes. But in a case recorded by Pereira (*Mat. Med.* vol. ii. p. 1806), where the root was eaten in mistake for horseradish, no effects were observed for nearly an hour. Generally, however, the tincture and the alkaloid act with very great rapidity, the effects following on absorption, which may happen in from two to eight minutes, according to the condition of the stomach and the general system at the time.

It must be recollected, however, that the effects of aconite on the system are not uniformly the same. Some anomalies have from time to time been observed; such as convulsions and slight spasmodic twitches of the muscles, owing doubtless, to venous congestion, the result of partial asphyxia; stupor and insensibility, due to the same cause, though they may have been confounded with extreme nervous depression and faintness; delirium; congestion of the mucous membrane of the stomach, &c. This, however, we have seen, is generally found in cases of sudden death. Nausea, vomiting, and pain in the epigastrium, are not regarded by Dr. Fleming as evidence of gastric irritation, as they may all be owing to the same local nervous impression which is produced on the organs of taste. He denies that *purging* is ever produced by aconite. Pallas, however, mentions that three out of five persons who took *tincture of aconite* died in two hours, with burning in the throat, vomiting, colic, swelling of the belly, and purging. (*Thèse Inaugurale*, Paris, 1822.) Degland relates an instance where four persons took the tincture by mistake, and

<sup>a</sup> Prof. A. T. Thomson remarks (*London Dispensatory*): "Although aconite operates topically, yet dissections of fatal cases have not displayed any particular marks of inflammatory action." (P. 181.)

three of them were seized with burning pain from the throat to the stomach, sense of swelling of the tongue and face, colic, tenderness of bowels, vomiting, and purging; one died in two hours, and one in two and a half hours.

The authenticity of these cases, of Pallas and Degland, is, however, doubted both by Fleming and Pereira, who suppose that it was the tincture of some other root that was taken. In the cases recorded by Pereira, no purging occurred. Diarrhœa, if it does occur in aconite poisoning, is an extremely rare phenomenon.

*Morbid Appearances.*—Ballardini, who met with twelve fatal cases of poisoning with aconite,<sup>1</sup> represents the pia mater and arachnoid as much injected; much serosity under the arachnoid and at the base of the brain; lungs considerably engorged with blood; heart, and great vessels contained a little black fluid blood; villous coat of stomach spotted with red points; the small intestines presenting red patches, and much mucus. In a case mentioned by Pereira, there was venous congestion of the head and chest, and great engorgement of the lungs and right side of the heart.<sup>2</sup> It cannot be denied that great redness of the mucous membrane of the stomach and small intestines, has been occasionally observed in cases of poisoning by aconite—as in the cases which occurred some years since at Lille, in France, and recorded in the *Edinburgh Medical and Surgical Journal*, vol. xxviii. p. 452. In some cases, the mucous membrane of the stomach has been found of a light reddish-brown colour; and in others still, quite natural in appearance. There is no instance on record, we believe, where aconite has produced inflammation of any of the mucous membranes or organs of the body, but merely congestion; and this may be of the brain, lungs, liver, spleen, and mucous surfaces; no softening or effusion of lymph, or other mark of inflammation, has ever been found in connection with the patches of redness produced by aconite. Its immediate action in lowering the action of the heart, and arresting or retarding the respiratory movements, proves conclusively its purely sedative and paralyzing power. The appearances on dissection in Mrs. H.'s case do not correspond with those generally observed in cases of poisoning by aconite.

*Chemical Testimony.*—Chemical evidence is very justly regarded as the most decisive of all the kinds of proof in medico-legal inquiries. In the present instance, however, the anatomical evidence appears to have been regarded as very important.<sup>3</sup> The case, however, undoubtedly turned chiefly upon the chemical evidence. This was deemed conclusive. It may have cost John Hendrickson, Jr. his life. Alas! as Raspail has observed, "it is never too late to unlearn an error, but an incorrect testimony, once given in a court of justice, can never be recalled. The sword of the law does not retrace its steps, as the opinion of an experimental chemist may."<sup>4</sup>

Dr. James H. Salishury, chemist, having charge of the New York State Laboratory, testified as follows:—

"With the portions of the subject submitted to me, I proceeded to make my tests for poisons. In this case, my chemicals were all pure, my implements

<sup>1</sup> *Annali Universali di Medicina*, 1840, iii. 635.

<sup>2</sup> Christison on Poisons, Am. ed. p. 668, 669, &c.

<sup>3</sup> Judge Marvin, in his charge to the jury, says: "We learn from the evidence of Dr. Swinburne, and other medical men, that *post-mortem* examinations will generally disclose the cause of death!" After minutely describing the morbid appearances, because, he says, "they form the facts or basis on which the professional witnesses found their opinion," yet he states that the coroner, Dr. Smith, could not find (though present at the first *post mortem*) the marks of inflammation or congestion in the stomach described by Dr. Swinburne!

<sup>4</sup> *Organic Chemistry*, p. 525.

and vessels clean. First, I took a small portion of the stomach, its mucous surface, and a small portion of the duodenum; tested first for prussic acid—did not detect its presence; then tested for some of the mineral poisons, first for arsenic, then for corrosive sublimate, the antimonial compounds, the mineral acids—such as muriatic, nitric, and sulphuric acids—also tested for oxalic acid; did not detect the presence of any of these. Next tested for morphine, strychnine, stramonine—also for other poisons, none of which I discovered. I then tested for *aconite*; the tests indicated *aconitine*, the poisonous principle of *aconite*. Took a small portion of the stomach and duodenum, digested it in alcohol over a water-bath, then filtered; evaporated the filtrate partially; the oily matter rose to the surface; this I separated by decantation, and then absorbed it from the surface by bibulous paper; then mixed the solution with *purified animal charcoal*, agitating it for some little time after mixing; filtered; and to this solution I applied my tests, as follows: I boiled a small portion of this solution with sulphuric acid; the solution was turned a deep port-wine red colour. I then boiled a small portion of the solution with hydrochloric acid; this turned the solution to light port-wine red colour. Then boiled a small quantity of the solution with nitric acid; the solution remained clear, with no change of colour. *From these tests I inferred the presence of aconitine.* I repeated these tests several times with the same results. The stomach and duodenum were what I made my preliminary tests with; these tests are what are laid down for *aconitine* by the best authors. I had made these tests previously, and had also made *aconitine* my special study. My tests produced the same results. I have applied them since with similar results. For two years previous to this, I had paid much attention to vegetable alkaloids, and among them especially *aconitine*, the poisonous principle of *aconite*. On the 15th of March I commenced the process of *analysis* for the purpose of separating *aconitine*, if present in sufficient quantity. I divided a portion of the remaining portions of the stomach and duodenum, and their contents, the small intestines, a portion of the liver, and a portion of the blood, into two equal parts. One of these portions I digested in alcohol for several hours over a water-bath; then filtered; partially evaporated; separated the oily matter by decantation and absorption; evaporated nearly to dryness; mixed with the alcoholic extracts pure caustic potassa; distilled; heated the distilled matter with dilute sulphuric acid, sufficient to neutralize it; evaporated this over a water-bath; treated it with pure alcohol, between 74 and 80 per cent.; filtered it; evaporated it nearly to dryness; treated the residue with pure caustic potassa, and again distilled; evaporated this slightly, and set it aside for future use. The other and second portion was digested in alcohol over a water-bath for several hours; filtered; evaporated partially; separated oily matter by decantation and absorption; evaporated nearly to dryness; treated the alcoholic extract with dilute sulphuric acid and distilled water; filtered; then evaporated it partially; treated the solution with ammonia to a slight excess; a precipitate was formed; this was carefully washed by a small quantity of water; this precipitate was redissolved in dilute sulphuric acid and distilled water; added to this solution a small quantity of purified animal charcoal, agitating for some minutes, and then filtered it; evaporated the filtrate slightly at a low temperature; added ammonia in slight excess; a precipitate was formed; this I carefully washed with a small quantity of distilled water; this result I mixed with the result obtained by the other process; in all there was about two-thirds of a teaspoonful. I was from the 15th to the 19th of March in getting through this process; it was going on day and night. In testing for this matter, I placed it on my tongue; it had a bitter taste; a sparkling (?) sensation at first, which, in three or five minutes, turned into a numbness, producing a stiffness of the surface; the sensation produced was very much like that in the foot when it is said to be asleep. This matter, which I separated by the process just mentioned, I gave to a cat; gave it in small pieces of beefsteak; in about half an hour she exhibited a choking sensation and swallowing; this was followed by slight contraction of the muscles, twitchings, which moved the limbs slightly, and this by a tendency to vomit. These spasms lasted from one to two minutes; considerable stupor succeeded; she lay down upon her

side and breathed heavily, as though she was under the influence of some narcotic; this lasted for some time; it gradually passed off, and in about three hours she was quite natural again. On the 29th of March, I gave this cat six drops *tinct. of aconite*. In administering it, I opened her mouth, held her head back, and poured the tincture immediately down her throat; after five or ten minutes she commenced swallowing; in fifteen minutes she commenced vomiting slightly; this vomiting continued for twenty-five minutes, when she became very weak, and fell upon her side; the vomiting here ceased; she breathed heavy and slow, and in one hour and a half after the poison was taken she died. The *post-mortem* was made seven hours and a half after she died. The stomach and intestines were found very much contracted; about one-third the usual size. The intestines were very much contracted and rigid; the walls thick. We then opened the stomach, and found a very high state of congestion; it was very much contracted on itself, and thrown into folds. The mucous coat was covered with a small quantity of mucus, tinged with blood. The duodenum was contracted; very much congested. The mucous coat was covered with mucus, tinged with blood. There was one or two places in the lower portion of the duodenum, where the mucus was tinged with bile; the whole was tinged with blood. The jejunum was considerably congested and contracted. The mucous coat was covered with mucus, tinged with blood. The ileum had much the same appearance as the jejunum, except that the mucus which covered its surface was of a slightly different colour—pure white; there was a little bile here. I found no fecal matter thus far; in the cæcum I found fecal matter; it was partially digested food, mixed with white frothy matter; the upper portion of the colon also contained fecal matter, which was thin and watery; not as thin and watery as that in the cæcum. The fecal matter grew harder as it approached the rectum; there was no purging. The urinary bladder was very much contracted; there was no water in it; the gall bladder was about half full."

*Question.* "After your researches and anatomical experiences, are you ready to swear that Mrs. Hendrickson was poisoned by aconite?"

*Answer.* "In my opinion she was poisoned by aconite."

Dr. S. further testified that—

"The *post-mortem* appearances of the stomach and intestines, and those of the animals killed with aconite, are not produced by any other substance known to him; and that he knows of no disease which will produce such appearances."

In examining the chemical evidence, we must first express our regret that the details of the processes employed by Dr. Salisbury, are so imperfectly given. We can only judge of the correctness of the results from the very meagre account presented in the evidence as published.<sup>1</sup> We shall, however, if we mistake not, discover such errors in the proceedings as to vitiate in a great degree, if not wholly, the conclusions which are drawn from them. We are first given to understand, that with "a small portion of the mucous surface of the stomach and duodenum," Dr. S. first tested for *prussic acid*, then for *some of the mineral poisons* (arsenic, corrosive sublimate, the antimonial compounds, the mineral acids, muriatic, nitric, and sulphuric), then oxalic acid; also for *morphine, strychnine, stramonine, (daturia?)* and also "for other poisons," but without success. These various processes, we presume, must have taken a considerable portion of the "small portion of mucous membrane" employed. We have no means of judging of the accuracy of the tests employed, for few, if any, details whatever are given.

Dr. S. then states "that he *tested for aconite*, and found it by proceeding as

<sup>1</sup> We assume, however, that the evidence of Dr. S. is correctly printed, as it was done at the place of his residence, and contains notes by himself, added after his testimony was given.

follows: He took, as before, a small portion of stomach and duodenum, digested it in alcohol over a water-bath, then filtered, evaporated the filtrate partially; the oily matter rose to the surface; this he separated by decantation, and then absorbed it from the surface by bibulous paper; then mixed the solution with purified animal charcoal, agitating for some time after mixing, filtered, and applied his acid tests as follows: First, he boiled a small portion of the solution with sulphuric acid; the solution was turned a *deep port-wine red colour*; then the same process with hydrochloric acid gave a *light port-wine red colour*; then with nitric acid, and the *solution remained clear*; and from these tests, Dr. S. says, "*he inferred the presence of aconitine*," but on what grounds we are totally at a loss to discover. Sulphuric acid boiled with aconitine gives a *dark brown tint*, according to Taylor, instead of a *deep port-wine red colour*; and animal matters, boiled with sulphuric acid, will give the latter colour *without the presence of aconitine*; so say Taylor and the best authorities on legal medicines. (*Taylor on Poisons*, Am. Ed. p. 615.)

Prof. Emmons, in a published letter to Gov. Seymour, of New York, states as the result of his experiments, that "sulphuric acid boiled with the tincture of aconite, obtained from the same sample as that supposed to have been sold to Hendrickson, *lost most of its red colour*, and became quite pale; boiled with pure aconite, the solution remained colourless, and the same result took place when boiled with nitric acid;" but that when he added oil or animal matters to the mixture of aconite, then he "obtained the red colours spoken of by Dr. Salisbury, and the same also occurred *when he employed the same tests on these animal matters alone*."

We think there can, therefore, be no doubt whatever that the results arrived at by Dr. S. were entirely due to the presence of organic matters, and not to aconitine, although the colour obtained by Dr. Emmons with sulphuric acid differs from that laid down by Taylor as resulting from a solution of pure aconitine.

But we are not called upon to reconcile this discrepancy; our aim is merely to show the incorrectness of the inference that aconitine was discovered by the process employed by Dr. S.<sup>1</sup>

To confirm the conclusion arrived at by these tests, Dr. S. then proceeded to separate a sufficient quantity of aconitine for experimenting with it on animals; and he "divided a portion of the remaining portions of the stomach and duodenum and *their contents*, the small intestines, a portion of the liver, and a portion of the blood, into two equal parts;" one of these he digested in alcohol over a water-bath, for several hours, "then filtered, partially evaporated, separated the oily matter by decantation and absorption, evaporated nearly to dryness, mixed pure caustic potassa with the alcoholic extracts, distilled, treated the distilled matter with dilute sulphuric acid sufficient to neutralize it; evaporated this over a water-bath, treated it with pure alcohol; filtered and evaporated it nearly to dryness; treated the residue with pure caustic potassa, and again distilled; evaporated slightly and set aside for future use."

The above process is that which was sometimes formerly pursued by chemists when examining for a *liquid and volatile alkaloid*, but why it should have been resorted to in the present instance, we are at a loss to understand; as Dr. S. states, in his cross-examination, that he believes aconitine "is a *fixed body*." We are still more at a loss to know why Dr. S. did not test the matters obtained, in order to ascertain whether he had discovered aconitine or any

<sup>1</sup> Before commencing the analysis, it would have been as well, perhaps, to have tested the substances employed, and seen whether they were *acid* or *alkaline*.

other alkaloid by this process. He neither tasted of it, examined it with a microscope, or gave any of it to the lower animals.

But the course pursued by Dr. S., even on the supposition that a volatile alkaloid was present, is not one which will approve itself to the minds of scientific chemists, as the most eligible.

In the first place, in examining the tissues of organs for a vegetable alkaloid, the organ should be divided into very small portions, then the mass moistened with pure alcohol, and expressed strongly; and so, by further treatment, exhaust with alcohol the tissues of everything soluble; then the liquid so obtained should be treated in the same way as a mixture of suspected matter and alcohol. Moreover, it is a principle now well established in medico-legal researches, that we should never use *animal charcoal* for decolorizing liquids, while searching for the alkaloids; for the very good reason that we, by so doing, may lose all the alkaloid in the suspected matter, animal charcoal having the power, as proved by M. Stas, of absorbing these substances, while, at the same time, it fixes the colouring and odoriferous matters. This error, then, would vitiate the results obtained by Dr. Salisbury, even were his other processes unexceptionable.

The true and only correct mode of proceeding, whether the alkaloid be fixed or volatile, would be that pointed out by M. Stas, who adopted it with such brilliant success in the case of M. Fougues, who was poisoned by his brother-in-law, Count Bocarmé, with *nicotine*. (See this *Journal* for Jan. 1854, p. 263, *et seq.*)

To the matter obtained by digesting the different organs suspected of containing the alkaloid with strong alcohol, twice their weight of pure alcohol should be added, and afterwards, according to the quantity and nature of the suspected matter, from ten to thirty grains of *tartaric* or *oxalic* acid should be added (the *tartaric* is preferable), we are then to introduce the mixture into a flask, and heat it to 160° or 170°. After it has cooled, it is to be filtered, the insoluble residue washed with strong alcohol, and the filtered liquor *evaporated in vacuo*; or, if the operator has not an air-pump, the liquid should be exposed to a strong current of air, at a temperature of not more than 90° F. If the residue, after the volatilization of the alcohol, contains fatty or other insoluble matters, the liquid should be filtered a second time, and then the filtrate and washings of the filter evaporated in the air-pump till nearly dry; or, if no air-pump is at hand, it should be placed over a bell-jar, over a vessel containing concentrated sulphuric acid. The residue is then to be treated with cold anhydrous alcohol, taking care to exhaust the substance thoroughly; and the alcohol should be evaporated in the open air, at the ordinary temperature, or what would be still better, *in vacuo*. The acid residue should then be dissolved in the smallest possible quantity of water, and the solution introduced into a small test-tube, and a little pure powdered bicarbonate of soda, or potash added, little by little, till a fresh quantity produces no further effervescence of carbonic acid. The whole should then be agitated with four or five times its bulk of pure ether, and left to settle, when the ether swimming on the top is perfectly clear, some of it should be decanted into a capsule, and left in a very dry place to spontaneous evaporation. We are now prepared to proceed to examine for a volatile or a fixed alkaloid, as the case may be; and no process less precise or carefully conducted, should be deemed worthy of confidence, in a case where life or death is hanging on the result.

Now if a *liquid alkaloid* be present, if we evaporate the ether, we shall have remaining on the inside of the capsule some small liquid striae, which fall to the bottom of the vessel; and by the heat of the hand alone, the con-

tents of the capsule will expel an odour more or less disagreeable, according to the nature of the alkaloid (if it possesses odour); it may be pungent, suffocating, irritant, or simply disagreeably narcotic, modified by an animal odour. If any traces of a volatile alkaloid be discovered, then we should add to the contents of the vessel, from which we have decanted a small quantity of ether, one or two fluidrachms of water, acidulated with a fifth part of its weight of pure sulphuric acid, then agitate for some time, leave it to settle; pour off the ether swimming on the top, and wash the acid liquid at the bottom with a quantity of ether, as most of the sulphates of the alkaloids are insoluble in ether, and the others but partially so. The water acidulated with sulphuric acid will contain the whole, or a greater portion of the alkaloid in the solution, while the ether will retain all animal matters which it has taken from the alkaline solutions. To extract the alkaloid from the solution of the acid sulphate, an aqueous and concentrated solution of potash or caustic soda is to be added; the mixture is agitated and exhausted with pure ether; the ether dissolves the ammonia, and the alkaloid is now free. The ethereal solution is exposed, *at the lowest possible temperature*, to spontaneous evaporation; nearly all the ammonia volatilizes with the ether, and the alkaloids remain as residue; and in order to separate every particle of ammonia, the vessel containing the alkaloid is to be placed, for a few minutes, in a vacuum over sulphuric acid, and the organic alkaloid is obtained with all the physical and chemical characters belonging to it.

By pursuing the process above detailed, M. Stas succeeded in detecting *nicotine* in the blood from the heart of a dog, poisoned by a very minute quantity of this substance, introduced into the oesophagus. He also positively determined its existence in the blood generally, by the tests of *odour*, *taste*, and *alkalinity*; also the chloroplatinate of the base *perfectly crystallized in quadrilateral, rhomboidal prisms*.

We believe if a volatile alkaloid had been present in the matters operated on by Dr. Salisbury, he could not have succeeded in detecting it by the processes which he employed.

Nor was the course pursued in relation to the second portion, which was examined for a *fixed alkaloid*, less liable to criticism. This was digested in alcohol over a water-bath, for several hours, then filtered and partially evaporated; the oily matter separated by decantation and absorption; evaporated nearly to dryness; the alcoholic extract treated with pure distilled water and filtered; the filtrate evaporated nearly to dryness; the water extract treated with dilute sulphuric acid and distilled water filtered; then evaporated partially, and the solution treated with ammonia to a slight excess; the precipitate formed was carefully washed with a small quantity of water, and redissolved in dilute sulphuric acid and distilled water. To this solution a *small quantity of purified animal charcoal* was added, then agitated for some minutes and filtered; the filtrate evaporated slightly at a low temperature, and ammonia added in slight excess. The precipitate formed was washed with a small quantity of distilled water, and the result was mixed with that obtained by the former process; "and in all there was about two-thirds of a teaspoonful," it requiring four days and nights to complete the process.

The same fatal error was here committed as before, by using animal charcoal, supposing the alkaloid to be a fixed body. Going back to our first process, it may happen that the evaporation of the solution resulting from the treatment of the acid matter, to which bicarbonate of soda has been added, may leave or not a residue containing an alkaloid. If it does, then a solution of caustic potash or soda is to be added to the liquid, and it is to be agitated

briskly with ether. This dissolves the vegetable alkaloid, now free and remaining in the solution. In either case, we exhaust the matter with ether; and whatever be the agent that has set the alkaloid free, whether bicarbonate of soda, or potash, or caustic soda, or potash, it remains by the evaporation of the ether on the side of the capsule, as a solid body, or more commonly as a colourless, milky liquid, holding solid matters in suspension, and having the physical, chemical, and toxicological properties of that peculiar alkaloid.

After an alkaloid has been discovered, the next thing which scientific accuracy demands is, that it should be obtained in a crystalline state, so as to determine its form; and this is generally done by putting some drops of alcohol in the capsule with the alkaloid, and leave the solution to spontaneous evaporation. It may, however, be too impure, by contamination with foreign matters, to crystallize, when some drops of water, feebly acidulated with sulphuric acid, should be poured into the capsule, and then moved over its surface, so as to bring it in contact with the matter in the capsule. The matter contained in it will separate into two parts, one formed of greasy matter, which remains adherent to the sides, the other alkaline, which dissolves and forms an acid sulphate. The acid liquid is then cautiously decanted, which ought to be limpid and colourless if the process has been well executed; the capsule is then to be well washed with some drops of acidulated water, added to the first liquid, and the whole is evaporated to three-fourths, *in vacuo*, or under a bell-jar, over sulphuric acid; a concentrated solution of pure carbonate of potash is then added to the residue, and the whole liquid treated with absolute alcohol. This dissolves the alkaloid, while it leaves untouched the sulphate of potash, and excess of carbonate of potash. The evaporation of the alcoholic solution gives the alkaloid in crystals, if crystallizable. With regard to aconitine, it is apparently crystalline, the fragments, according to Pereira, appearing under the microscope like thin plates of chlorate of potash, varying greatly in shape, though the triangular form is most common. Dr. Pereira states that he could discover no distinct crystals. But Dr. Salisbury neither gives us the physical nor chemical properties of what he supposed to be aconite.

We have given the improved process of M. Stas of searching for the vegetable alkaloids, because of its superiority to former methods;<sup>1</sup> and it is now acknowledged by the ablest chemists as the most accurate of any yet known. We have seen that the evidence of the existence of aconitine, from the mode of proceeding, and the tests employed by Dr. S., is inconclusive, and comparatively worthless; and it is no less evident that that furnished by his subsequent analysis is equally valueless. It is so, because there is observable, through the whole processes, a departure from those rules which apply to such cases, and because the most common precautions for securing accuracy were neglected. The results, colourations, which were supposed to indicate the presence of aconitine, have been demonstrated to be owing to the action of the acids employed on organic matters. Reasoning by exclusion, which should be rigidly carried out in such cases, and to its utmost limits, would have led, and without much labour, to the correction of this first fatal error. If the substance found was aconitine, as believed, then, as no fact is better known than that this is a *fixed body*, why the very unscientific process of separating it by distillation, as a volatile substance? Dr. S. states, in his testimony, that he had made *aconite* a subject of particular study for two years previously, and yet he had not learned whether it was or not a fixed

<sup>1</sup> Orfila on Nicotine. Paris, 1851.



alkaloid; and that "he was not sure by which of his processes aconitine was obtained, as he tasted of neither before they were mixed." He might have been very sure he had not obtained it by distillation, for it was a chemical impossibility; he might have been pretty confident, however, that *ammonia* could thus be procured. We shall not, however, enter into a detailed criticism of the second analysis, because we conceive it to be unnecessary. With regard to the character of the precipitate formed, it is most probable that it was *phosphate* and *lactate of lime*, derived from the animal fluids employed in the analysis; but, as the physical and chemical characters of this precipitate are nowhere described, we are wholly left to conjecture. Here, at this point, by simple chemical methods, proof could have been accumulated which would have put the matter forever at rest; as it is, no one is satisfied, and every one is incredulous. All the first chemists of the country, including the Sillimans, Dana, Torrey, Chilton, Wells, Ellet, Bacon, Hayes, Porter, Kent, Emmons, Beck, &c., have published to the world their opinion, that, in their judgment, "no chemical result stated by Dr. Salisbury furnishes satisfactory evidence of the existence of aconitine or its compounds, in the fluids or organs submitted to examination."<sup>1</sup>

If the reader will compare the process of M. Stas, as we have detailed it, with that actually pursued by Dr. S., the inaccuracy and unscientific nature of the latter will be obvious. In his cross-examination, Dr. S. states that he believes that he obtained from  $\frac{1}{8}$  to  $\frac{1}{3}$  gr. of aconitine in the matters analyzed. Prof. Emmons states that there does not exceed  $\frac{1}{8}$  gr. in  $\frac{3}{4}$  of Burrough's tincture; and Dr. Reid stated, in his testimony, that he had found, by actual experiment, that there is  $\frac{1}{8}$  gr. in  $\frac{3}{4}$  of the tincture. (It is only claimed that  $\frac{3}{4}$  was given to Mrs. Hendrickson!)

Dr. S. states that he tested the matter which he had obtained (the precipitate) by placing it on his tongue; that "it had a bitter taste, a sparkling (?) sensation at first, which turned into a numbness in a few minutes, producing a stiffness of the surface," &c. The substance, being the precipitate ( $\frac{1}{8}$  gr.), to which a small quantity of water had been added, amounted, we are told, to "about two-thirds of a teaspoonful," probably. But a few drops of this was used for testing; if two drops, then but about  $\frac{1}{8}$  of a grain was employed, to which these effects must have been owing; and this upon the supposition that the aconitine was equally distributed throughout the mixture. The whole remaining portion was administered to a *cat*, without any one present to notice the effects but himself, and the life of an individual hanging on the result!<sup>2</sup> The substance was given in small pieces of beefsteak. "In half an hour she exhibited a *choking sensation* and swallowing, followed by slight contraction of the muscles; twitchings, which moved the limbs slightly, and then a *tendency* to vomit; considerable stupor succeeded; she lay down on her side and breathed heavily, as if under the influence of a narcotic; this lasted some time; it gradually passed off, and in three hours she was well again."

This same cat was killed in one hour and a half, a week afterwards, by giving it *six drops of tinct. of aconite*. Symptoms: "swallowing, slight

<sup>1</sup> Alb. Eve. Journ. April 29, 1854.

<sup>2</sup> In the case of Count Boearmé, M. Stas experimented with *nicotine* obtained, on small birds, as sparrows, which are extremely sensitive to the action of the vegetable alkaloids; and the remainder was carefully sealed and labelled, to exhibit at the trial, and for experiments before the jury. Such a course, we believe, is not unfrequently pursued on the continent, especially in Germany and France, and it is one which must commend itself to every lover of science and humanity.

vomiting, weakness, and heavy, slow breathing." *Post-mortem* appearances identically the same as in the case of Mrs. Hendrickson, or, as Dr. S. testified, "they were so similar, that it was almost impossible to distinguish a shade of difference between them." (P. 53.)

It certainly seems a strange anomaly, that while  $\frac{1}{25}$  of a grain of aconitine did not injure the cat materially, *sic* drops of the tincture should have proved fatal!—the whole ounce, according to Prof. Emmons, only containing but the  $\frac{1}{768}$  part of a grain, which would give about  $\frac{1}{36864}$  of a grain in six drops. We do not vouch for the accuracy of this calculation; we only record it as one of the difficulties in the case.<sup>1</sup> Well did Mr. Wheaton, in his able defence, remark that "the cat should have died (by the first experiment) out of deference to the Doctor's opinion; or, the Doctor should have given up his opinion out of deference to the life of the cat."

We have not designed to offer any comments upon the *moral* evidence submitted in this case—any further, at least, than it is connected with the medical and legal evidence. We may, however, be allowed to say, that it lends little or no confirmation to the belief that poison was administered to Mrs. H. It was not proved that the prisoner ever purchased aconite, knew of its properties, or had it in his possession. The charges brought against his moral character, in the opening speech of the prosecuting attorney, particularly in regard to his having had gonorrhœa, and having imparted the same to his wife, were wholly unsustained by any evidence offered on the trial. The object aimed at, viz: prejudicing the minds of the jury against the prisoner, was, however, perhaps as fully attained as if the charges had been proved. There was no evidence that any vomiting had taken place; indeed, everything went to show that it had not; the countenance of the

<sup>1</sup> It is true, we have no precise information as to the quantity of aconitine contained in the root of the plant. Prof. L. Reid, of N. Y., testified that he had obtained but one grain from one pound of the root, and believes that no more than that amount can be obtained. He also states that the taste of aconitine can be detected in  $\frac{1}{1000}$  part of a grain. Prof. Emmons expressed the opinion that  $\frac{3}{32}$  of the tincture of aconite contains but  $\frac{1}{768}$  of a grain, allowing  $\frac{3}{32}$  of the root to  $\frac{3}{32}$  of alcohol. Dr. Burroughs, in a letter recently received from him, states that he followed the U. S. P. of 1850 in preparing his tincture, which directs one pound of the root to two pints of alcohol, which would give four times the strength as estimated by Prof. E. But even this, on Prof. Reid's estimate, would give less than  $\frac{1}{200}$  of a grain to  $\frac{3}{32}$  of the tincture; but, as half a drachm of this tincture would be a hazardous and perhaps a fatal dose, and as this would be but the twenty-fourth part of an ounce, or the  $\frac{1}{4800}$  part of a grain, we must acknowledge that there are some difficulties about these calculations which require to be cleared up. Dr. Pereira states that the one-fiftieth part of a grain of aconitine has endangered the life of an individual, and that it is by far the most poisonous principle known. Prof. Christison found 30 grains of an alcoholic extract kill a rabbit in two hours and a quarter; and this was the whole produce of three-quarters of an ounce of the fresh leaves. And, in another experiment, one-tenth of a grain introduced into the cellular tissue of a rabbit, killed it in twelve minutes. Orfila gave five drachms to a dog, and it killed him in twenty-one minutes. But the results were very various in his experiments, which he accounts for from the different pharmaceutical processes employed in making the preparations. In one instance, *e. g.*, he gave  $\frac{3}{32}$  ss extract of aconite to a dog without any effect; in another case, one-fourth of an ounce of the extract killed a dog in two hours. All experimenters agree in the opinion that it is not *narcotic*, and Pereira found that it never produced stupor, or affected the mental faculties.

With regard to animal charcoal absorbing the active principle of aconite along with its colouring matter, Prof. Emmons has stated that he "had employed the tincture of aconite as the substance operated upon, and had not only insulated the active principle in the charcoal itself, but had subsequently dissolved it out by means of alcohol."—*Letter to Gov. H. Seymour of New York, in Alb. Eve. Journ.* April 29, 1854.

deceased was mild and placid; no distortion, no disheveling of the hair, no wrinkle or spots on her clothes, no signs of violence upon the exterior of the body, no marks of suffocation; the deceased lay as if asleep, and everything in the room in the same condition as when she retired to rest. This does not look like severe vomiting, or death from violence—unless, possibly, from chloroform—but this is not charged. The Judge (Marvin), in his charge to the jury, seems to take the ground that, if the medical witnesses, called for the defence, could not prove what was the actual cause of death, it was right to assume that the deceased came to her death by violence on the part of her husband! “It would be more satisfactory,” he says, “if these medical witnesses had assigned some natural cause for her death;” as if the burden of proof rested on the prisoner, instead of the people, although he expressly disclaims any such ground. We confess that the case is enveloped in considerable mystery, but no more than enshrouds hundreds of cases of sudden death. We were called once to see a lady who, in the enjoyment of a comfortable state of health, while attending a social gathering at her own house, was seized with a fainting fit, and died in spite of all the means employed before our arrival. We made a careful *post mortem* the next day of all the vital organs, but there was no cause of death discoverable. The walls of the heart were thinner than usual, and syncope was occasioned by violent mental emotion, which resulted fatally. We have known several cases of sudden death from syncope, without any *post-mortem* lesion sufficient to account for the death. Fatal cardiac asthenia may be produced by mental emotions, and no *post-mortem* change or lesion discovered. It may have been so in the present instance. There was considerable uterine disease, as ulceration and congestion of the os uteri, and leucorrhœa; sympathetic disturbance of the heart may have been occasioned by mental emotion acting upon this predisposition, and death occurred as in the case already alluded to. Or, she may have inhaled chloroform to relieve pain, of which she had complained much during the day; or, she may have taken an overdose of *homœopathic* pills of aconite, of which she had a considerable quantity on hand just before her death, and which she carried in her pocket (of which none were found afterwards.)<sup>1</sup> Many causes might be assigned to account for her death, any one of which would be more probable than that she was poisoned by an ounce of tincture of aconite. There is one fact stated by the Judge in his charge, as of very great importance, and one which we have not as yet particularly noticed, and that is, a small *ecchymosis* or bruise on the inside of the lip. The Judge says this “furnishes overwhelming evidence of guilt to his mind.” Dr. Swinburne describes it in his testimony as “a black and blue bruise between the size of a sixpence and a ten-cent piece, inside of the lower lip, and a little to one side; in it there was a cut about a quarter of an inch long; it must have occurred before death.” This slight mark is exaggerated into a degree of importance it does not deserve. It was proved by the mother that the deceased complained two days before her death of a sore on the same lip. The evidence that the *ecchymosis* was caused during life is by no means satisfactory; indeed, no evidence is gone into, or facts detailed, which have any bearing on this point. It is stated by the mother, that violent attempts were made by her to open the mouth, for the purpose of administering a little camphor and water, as soon as it was discovered that her daughter was dead; and probably this was not long after she ceased to breathe. The *ecchymosis* may

<sup>1</sup> It is also held by some pathologists that death may suddenly occur from apoplectic congestion of the brain, and cerebral fulness disappear after death.

have been thus produced, though we think it more probable that it existed before death. Such marks, moreover, are not unfrequently caused by the teeth during a convulsive paroxysm. Standing alone, it by no means proves any violence on the part of the accused.

Another feature in this trial is worthy of mention, perhaps, and that is the great importance attached to the confident and positive statements of Drs. Swinburne and Salisbury, both young men, and comparatively inexperienced, and the little weight which seems to have been allowed to the more careful and judicious testimony of Drs. Emmons and Staats, men of age, professional skill, and enlarged experience. The *positive* statements of the former would probably, with such a court and jury, have outweighed the negative testimony of all the first pathologists and chemists of the age. The result shows very clearly the importance of qualifying and guarding our statements and opinions where facts will allow of another interpretation, and where they fall short of actual demonstration.

We have thus successively passed in review the most important features in this interesting trial, and made such comments as seemed to us appropriate to the occasion. We know none of the parties, nor are we influenced by any personal considerations whatever. Medico-legal science demands thus much, at least, at our hands. If we have spoken with undue severity, in regard to any testimony offered, it will ever be to us a source of regret. But the interests of science and humanity require that the medical and chemical evidence, on the strength of which the life of a human being has been taken, should be closely scrutinized, and in all the lights which observation, reason, common sense, and true science may furnish us. The case will stand as a precedent in medico-legal questions that may hereafter come before our courts. It is all-important to know whether the questions it involves have been decided correctly or not; whether it may be referred to as a safe or an unsafe precedent for witnesses, courts, and juries in future times. We have sufficiently indicated our opinion. We are ready, however, to retract whenever our reason is convinced that we have been led into error—not before. It is in vain, for it is too late, to lament the probable sacrifice of an innocent man; but, if what we have written serves but to throw an additional safeguard hereafter around the wrongfully accused, our purpose will have been fully accomplished. We will venture one remark more. It seems to us no less strange than lamentable, that in a case which appears to have rested solely on anatomical, or pathological and chemical evidence, the counter opinions and statements of the leading men in these departments of science in the country should have had so little weight with the executive or judicial power as not to lead to a commutation of punishment, nor even to an order for a new trial, which was demanded. We pretend not to fathom the hearts or the motives of men, but we think we see in the present instance an example and illustration of the force of outward pressure—of popular excitement and prejudice—on witnesses, counsel, judges, and jury, which makes us question, at times, whether the boasted right and privilege of trial by jury, be, indeed, a blessing or a curse.

C. A. L.